

**REMARKS**

Claims 1-16 are currently pending in the subject application and are presently under consideration. Claims 17-25 have been withdrawn pursuant to a restriction requirement and hereby cancelled. Claims 1, 2, and 13 have been amended herein. Claim 8 has been cancelled and claims 26-28 have been newly added. A complete listing of the claims showing changes made in revised amendment format can be found at pages 3-5. The specification has been amended herein at page 2 to correct minor typographical errors. Additionally, a change has been made to the drawings. An explanation of the change can be found at page 6 and a replacement sheet is enclosed herewith. Favorable reconsideration of the subject patent application is respectfully requested in view of the amendments and comments *infra*.

**I. Objection to Claim 13 for Informalities**

Claims 13 stands objected to for informalities. An appropriate amendment has been made to claim 13 herein to cure the noted informality. Accordingly, this objection should be withdrawn.

**II. Rejection of Claims 2-4 Under 35 U.S.C. § 112, Second Paragraph**

Claims 2-4 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Withdrawal of this rejection is requested for at least the following reasons. Claim 2 has been amended herein to cure the cited indefiniteness. Claims 3 and 4 stand rejected as indefinite based solely on their dependency on claim 2 and have been rendered definite herein *via* the amendment to claim 2. Accordingly, this rejection should be withdrawn.

**III. Rejection of claims 1, 2 and 5-7 Under 35 U.S.C § 102 (b)**

Claims 1, 2, and 5-7 stand rejected under 35 U.S.C. § 102 (b) as being anticipated by Kumihashi, *et al.* (U.S. 6,136,721). Withdrawal of this rejection is respectfully requested for at least the following reason.

Kumihashi, *et al.* fails to disclose, teach, or suggest all the elements set forth in independent claim 1.

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For a prior art reference to anticipate, 35 U.S.C. §102 requires that “*each and every element as set forth in the claim is found*, either expressly or inherently described, *in a single prior art reference.*” *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (quoting *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)) (emphasis added). “*The identical invention must be shown in as complete detail as is contained in the ... claim.*” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Kumihashi, *et al.* fails to disclose, teach, or suggest an overetch system comprising a *device model that includes layout data and controlled removal of an overetch amount based at least on overetch parameters provided to the controller by the device model* as recited by claim 1. Rather, Kumihashi, *et al.* merely discloses and teaches an overetching system that monitors a semiconductor device being etched and adjusts the effective pumping speed to lessen or increase the intensity of etching plasma. In addition, the Examiner concedes in the subject Office Action, page 4, that “Kumihashi fails to disclose a device model to provide overetch parameter[s] to the overetch controller.” Furthermore, the addition of the secondary reference Chao, *et al.* and/or the tertiary reference Smith fails to make claim 1 obvious as discussed below. Accordingly, claim 1 (as well as claims 2-7 depending thereon) is allowable and this rejection should be withdrawn.

#### **IV. Rejection of Claims 3-4 and 8-9 Under 35 U.S.C. § 103(a)**

Claims 3-4 and 8-9 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Kumihashi, *et al.* (U.S. 6,136,721) in view of Chao, *et al.* (U.S. 5,780,315). Withdrawal of this rejection is requested for at least the following reasons.

Claims 3-4 and 9 (as well as 2, 5-7, 10-15) depend from claim 1 which incorporates the subject matter of canceled claim 8. Independent claim 1 recites a device model that includes layout data. Kumihashi, *et al.* alone or in combination with Chao, *et al.* fails to disclose, teach, or suggest a device model that includes layout data. As described above, Kumihashi, *et al.* merely discloses and teaches an overetching system that monitors a semiconductor device being etched and adjusts the effective pumping speed to lessen or increase the intensity of etching plasma. Chao, *et al.*, on the other hand, discloses an overetching methodology that utilizes the time to endpoint of the main etch and a chart of experiences mapping overetch times to the detected endpoint time of the main etch. Chao, *et al.* fails to disclose or teach a device model let alone a device model that includes layout

data. The chart of experiences, as disclosed by Chao, *et al.*, is simply a chart of empirical data mapping main etch endpoints to overetch times. The chart of experience is not a device model, as recited by claim 1. Hence, Chao, *et al.* fails to make up for the deficiencies of Kumihashi, *et al.* with respect to the independent claim limitations. Accordingly, the claim 1 (as well as claims 2-7 and 9-15 depending therefrom) is allowable in view of the cited art and withdrawal of this rejection is respectfully requested.

**V. Rejection of Claims 11 and 15 Under 35 U.S.C. § 103(a)**

Claims 11 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kumihashi, *et al.* and Chao, *et al.* and further in view of Smith (U.S. 6,322,935). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claims 11 and 15 are allowable for the same reasons as independent claim 1 from which they depend.

Furthermore, claims 11 and 15 are allowable at least because Smith is not a properly combinable reference. Specifically, the prior art, absent use of impermissible hindsight, fails to provide a suggestion or motivation in the prior art to combine Smith with Kumihashi, *et al.* and Chao, *et al.* as proposed by the Examiner.

*The prior art items themselves must suggest the desirability and thus the obviousness of making the combination without the slightest recourse to the teachings of the patent or application.* Without such independent suggestion, the prior art is to be considered merely to be inviting unguided and speculative experimentation which is not the standard with which obviousness is determined. *Amgen, Inc. v. Chugai Pharmaceutical Co. Ltd.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991); *In re Laskowski*, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989); *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988); *Hodosh v. Block Drug*, 786 F2f at 1143 n. 5., 229 USPQ at 187 n. 4.; *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1985).

Smith discloses a method of correcting or eliminating defect errors in a phase shift photomask utilizing a focus ion beam (FIB) and a three-dimensional representation of the defect. Such a disclosure fails to teach or suggest a control model utilizing three-dimensional information, as recited by claim 15, or etch control models that include layout data, etchable data, and percentage of

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etchable area, as recited by claim 11, in conjunction with a system to overetch a material on a target device. Smith shows no recognition of or pertinence to the problem of overetching devices for a particular time period so as to prevent a device from shorting or bridging. Rather, Smith is solely concerned with utilizing three-dimensional information to eliminate a particular type of three-dimensional photomask defect. Moreover, Smith explicitly teaches utilizing the three-dimensional representation, map, or information to *prevent overetching* (See col. 7, lines 45-50). Accordingly, a person of skill in the art, absent knowledge of the presently claimed invention, would not consult Smith alone or in combination with other references in an attempt to derive a system and method for overetching a device. Hence, it is submitted that this obviousness determination resulted from the improper use of hindsight in which the instant application provided the missing teaching and/or motivation for the combination. The Federal Circuit Court has consistently held that one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to depreciate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1988) (citations omitted). In accordance therewith, this rejection should be withdrawn.

## **VI. Rejection of Claim 16**

The Examiner has indicated in the Office Action Summary (PTO-326) that claim 16 has been rejected, but has failed to state any reasons for the rejection. Hence, this rejection should be withdrawn. However, for purposes of completeness, it should be noted that Kumihashi, *et al.*, Chao, *et al.* and Smith alone or in combination fail to disclose, teach, or suggest a set of etch control models and a control means for selecting at least one relevant model from the set of etch control models and determining an overetch endpoint, as recited by claim 16. Accordingly, allowance of this claim is respectfully requested.

## **VII. New Claims 26-28**

Claims 26-28 have been newly added herein to emphasize additional aspects of the subject invention. Claims 26-28 are believed to be allowable in view of the presently cited art. Accordingly, entrance and allowance of these claims is respectfully requested.

### CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063.

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,

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